CONTENTS OF VOLUME V., SECOND SERIES.

JANUARY, 1915.

On the Maintenance of Combinational Vibrations by Two Simple Harmonic Forces. C. V. RAMAN 1

Resistance of Carbon Contacts in the Solid Back Transmitter. A. L. CLARK 21

Notes on Electrode and Diffusion Potentials. G. W. MOFFITT 31

The Leduc Effect in Some Metals and Alloys. ALPHEUS W. SMITH and ALVA W. SMITH. 35

Photo-active Cells with Fluorescent Electrolytes. GEO. E. THOMPSON 43

A Comparative Study of the Light-Sensibility of Selenium and Stibnite at 20° C. and —190° C. D. S. ELLIOTT 53

An Extension Toward the Ultra-Violet of the Wave-Length-Sensibility Curves for Certain Crystals of Metallic Selenium. L. P. SIEG and F. C. BROWN 65

Note on the Induction Coil Spark. WILL C. BAKER 68

Proceedings of the American Physical Society 72

Minutes of the Seventy-Fourth Meeting; Some Fundamental Electro-Mechanical, Photo-Electrical and Electrical Relations in Crystals of Metallic Selenium, *F. C. Brown;* The Application of the Electron Theory to the Explanation of the Electrical Conduction in Crystals of Metallic Selenium, *F. C. Brown;* The Effect of Current and External Heating upon the Elasticity of a Mild Steel and an Aluminium Wire, *H. L. Dodge;* Determination of the Wave-Length of Characteristic Roentgen Rays by Means of Diffraction and by the Photo-electric Effect, *Oscar Alan Randolph;* Determination of the Elementary Charge of Electricity by Means of Magnetic Properties and the Magneton, *Jakob Kunz;* The Direct Current Corona of a Wire through a Circular Opening of a Disc, *L. W. Faulkner;* A Comparison of Simultaneous Measurements of Short Distances between Conducting Flats in Air, by the Optical-Electrical Method, *L. E. Dodd;* Experimental Determination of the Relation between the Corona Current and the Increase of Pressure Due to D. C. Corona; Possibilities of a High Voltmeter Based on this Pressure Phenomenon, *E. H. Warner;* The Leading Characteristics of the Electric Furnace Spectra of Vanadium and Chromium, *Arthur S. King.*

List of Members of the American Physical Society 81

FEBRUARY, 1915.

A Determination of Latitude, Azimuth, and the Length of the Day Independent of Astronomical Observations. ARTHUR H. COMPTON 109

Application of a Theory of Ionization by Impact to the Experiments of Franck and Hertz. BERGEN DAVIS 118

A New Form of Resistance Thermometer. S. LEROY BROWN 126

The Diurnal Variation of the Earth's Penetrating Radiation at Manila, Philippine Islands. LEOPOLD J. LASSALLE 135

An Addition to a Theory of Ionization by Impact. H. W. FARWELL 149

Atomic Numbers and Atomic Charges. FERNANDO SANFORD 152

Temperature Changes Accompanying the Adiabatic Compression of Steel. K. T. COMPTON and D. B. WEBSTER 159

The Electrical, The Photo-Electrical and the Electro-Mechanical Properties of Certain Crystals of Metallic Selenium, with Certain Applications to Crystal Structure. F. C. BROWN 167

288021

Proceedings of the American Physical Society 176
Minutes of the Seventy-Fifth Meeting; A Method of Determining Whether or not the Velocity of Light Depends upon the Velocity of the Source, by the Use of Canal Rays, *Gordon S. Fulcher;* Note on Thermo E.M.F.'s in which the Resultant Peltier E.M.F. is Zero, *H. C. Barker;* Linear Resistance Change with Temperature of Certain Molten Metals, *Edwin F. Northrup;* Influence of Concentration of Electrolyte upon Electrode Potentials, *Arthur W. Ewell;* The Alleged Dissymmetrical Broadening of the D Lines of Sodium, *E. A. Eckhart;* Ionization at Metallic Surfaces, *G. W. Stewart;* Light Produced by Recombination of Ions, *C. D. Child;* A New Method for Measuring Gravity at Sea, with Some Trans-Pacific Observations, *Lyman J. Briggs;* Leakage of Gases through Quartz Tubes, *E. C. Mayer.*
New Books 186

MARCH, 1915.

A Method of Determining the Radiant Luminous Efficiency of a Light Source by means of a Cell whose Transmission Curve is identical with the Luminosity Curve of the Average Eye. ENOCH KARRER 189
Theory and Use of the Molecular Gauge. SAUL DUSHMAN 212
Flicker Photometer Measurements by a Large Group of Observers on a Monochromatic Green Solution. HERBERT E. IVES and E. F. KINGSBURY 230
Isolated Crystals of Selenium of the Second and Fifth Systems and the Physical Conditions Determining their Production. F. C. BROWN 236
The Intensities of X-Ray Spectra. DAVID L. WEBSTER 238
Some Secondary Effects from Roentgen Rays. PAUL T. WEEKS 244
A New Hydrometer of Total Immersion with Electro-magnetic Compensation. ANDERS ÅNGSTRÖM 249
Signal Propagation in Dispersive Media. WALTER COLBY 253
Proceedings of the American Physical Society 266
On the Variation in the Sensitivity of Moving Coil Galvanometers, *Paul E. Clopsteg;* Preliminary Note on a Mercury Vapor Tube Oscillator, *B. Liebowitz;* A New Method of Obtaining a Hysteresis Loop, *W. N. Fenninger;* Vapors with Positive Specific Heat in Energy Conversion, *J. E. Siebel.*

APRIL, 1915.

The Mechanical Equivalent of Light. HERBERT E. IVES, W. W. COBLENTZ and E. F. KINGSBURY 269
The Corona in Air at Continuous Potentials and Pressures Lower than Atmospheric. DONALD MACKENZIE 294
On the Extraction and Purification of Radium Emanation. WILLIAM DUANE 311
The Nature of the Ultimate Magnetic Particle. K. T. COMPTON and E. A. TROUSDALE. 315
Proceedings of the American Physical Society 319
Luminescence, *Ernest Merritt;* The Law of Fall of a Droplet through Hydrogen, *R. A. Millikan, W. H. Barber and G. Ishida;* Notes on the Atomic Nuclei, *William Duane;* X-Rays Produced by Slow-Moving Cathode Rays, *Elizabeth R. Laird;* X-Rays from the Electrical Discharge, *Elizabeth R. Laird;* An Agglomeration Theory of the Variation of the Specific Heat of Solids with Temperature, *Arthur H. Compton;* A New Device for Rectifying High Tension Alternating Currents, *Saul Dushman;* Thermal Capacity of Tungsten at Incandescent Temperatures, and an Apparent Lag of Radiation Intensity with Respect to Temperature, *A. G. Worthing;* On the Reflecting Power of a Certain Selenium Crystal, *L. P. Sieg* and *F. C. Brown;* The Arc in a Longitudinal Magnet Field, *R. F. Earhart;* Transmission of Sound through Fabrics, *F. R. Watson;* A Differential Dynamic Method for the Accurate Determination of the Vapor Pressure Lowering of Solutions, *E. W. Washburn.*
New Books 344

MAY, 1915.

The Infra-Red Transmission and Reflection of a Number of the Aniline Dyes. J. B. JOHNSON and B. J. SPENCE 349
Note on the Value of Joule-Thomson Observations for Computing Steam Tables. HARVEY N. DAVIS 359
The Result of Plotting the Separation of Homologous Pairs Against Atomic Numbers instead of Atomic Weights. HERBERT E. IVES and OTTO STUHLMANN, JR. 368
The Change in the Elasticity of a Mild Steel Wire with Current and External Heating. H. L. DODGE 373
Thermal Electromotive Forces of Iron Oxide and Copper Oxide. S. LEROY BROWN and L. O. SHUDDEMAGEN 385
The Total Luminous Efficiencies of Present-Day Illuminants. HERBERT E. IVES 390
The Nature of Electric Conduction as Required to Explain the Recovery of Resistance of Metallic Selenium Following Illumination. F. C. BROWN 395
Some Experiments on the Nature of Transmitted Light-Action in Crystals of Metallic Selenium. F. C. BROWN 404
Determination of Ne for Hydrogen from Measurements of Brownian Movements. CARL F. EYRING 412
Fluorescence of the Uranyl Salts under X-ray Excitation. FRANCIS G. WICK 418
Integration of Thermodynamic Equations for an Imperfect Gas. SANFORD A. MOSS 426

JUNE, 1915.

The Thomson Effects in Tungsten, Tantalum and Carbon at Incandescent Temperatures Determined by an Optical Pyrometer Method. A. G. WORTHING 445
Mutual Inductances of Circuits Composed of Straight Wires. GEORGE A. CAMPBELL .. 452
The Variation with Meteorological Conditions of the Amount of Radium Emanation in the Atmosphere, in the Soil Gas, and in the air Exhaled from the Surface of the Ground, at Manila. J. R. WRIGHT and O. F. SMITH 459
The Cathode Fall in Gases. C. A. SKINNER 483
Total Radiation from Metals. VERNON A. SUYDAM 502
The Maxwell Distribution Law in Newtonian and Non-Newtonian Mechanics. GILBERT N. LEWIS and ELLIOT Q. ADAMS 516
Proceedings of the American Physical Society 527
Minutes of the Seventy-sixth Meeting.
Index 523